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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,771	08/20/2001	Kazutaka Yanagita	1232-4412US1	6944

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EXAMINER

GRAYBILL, DAVID E

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 09/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/931,771

Applicant(s)

YANAGITA ET AL.

Examiner

David E Graybill

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 43-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 43-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,7,9. 6) ☐ Other: \_\_\_\_\_

The information disclosure statements filed 2-19-2 and 6-24-2 fail to comply with 37 CFR 1.98(a)(3) because they do not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of documents AP and AH listed that are not in the English language. They have been placed in the application file, but the information referred to therein directed to documents AP and AH has not been considered.

In the rejections infra, reference labels are generally recited only for the first recitation of identical language.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (e) the invention was described in-
  - (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
  - (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claim 44 is rejected under 35 U.S.C. 102(e) as being anticipated by Yamagata (6103598).

Art Unit: 2827

At column 5, lines 15-16 and 61-63; column 6, lines 19-27; column 6, line 53 to column 7, line 12; and column 9, lines 1-4; Yamagata teaches the following:

44. A semiconductor substrate fabrication method comprising: the step of forming an unporous layer 102 on a porous layer 101 formed on a surface of a first substrate 100; the step of adhering a first substrate side of a prospective structure and a second substrate 110 prepared separately to sandwich said unporous layer between the first substrate side and said second substrate; the removal step of removing said first substrate from the adhered structure to expose said porous layer on a second substrate side thereof; and the etching step of etching said porous layer while the second substrate side on which said porous layer is exposed is completely dipped ["immersed"] into an etching solution, and ultrasonic waves are supplied, thereby exposing a surface of the second substrate side, the etching step moving the second substrate side.

To further clarify the teaching of the etching step moving the second substrate side, it is noted that the supplied ultrasonic waves inherently vibrate, and hence move, the substrate side.

Art Unit: 2827

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 43 and 45-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sakaguchi (5277748) and Matsushita (5071776).

At column ?? Sakaguchi teaches the following:

Art Unit: 2827

43. A semiconductor substrate fabrication method comprising:  
forming an unporous layer 23 on a porous layer 22 formed on a surface of a first substrate 21; adhering a first substrate side of a prospective structure and a second substrate 24 prepared separately to sandwich said unporous layer between the first substrate side and said second substrate; removing said first substrate from the adhered structure to expose said porous layer on a second substrate side thereof; and etching said porous layer while the second substrate side on which said porous layer is exposed is contacted by an etching solution, thereby exposing a surface of the second substrate side.

45. A semiconductor substrate fabrication method comprising: the step of forming an unporous layer on a porous layer formed on a surface of a first substrate; the step of adhering a first substrate side of a prospective structure and a second substrate prepared separately to sandwich said unporous layer between the first substrate side and said second substrate; the removal step of removing said first substrate from the adhered structure to expose said porous layer on a second substrate side thereof; and the etching step of etching said porous layer while the second substrate side on which said porous layer is exposed is contacted by an etching solution, thereby exposing a surface of the second substrate side.

Art Unit: 2827

46. A semiconductor substrate fabrication method comprising: the step of forming an unporous layer on a porous layer formed on a surface of a first substrate; the step of adhering a first substrate side of a prospective structure and a second substrate prepared separately to sandwich said unporous layer between the first substrate side and said second substrate; the removal step of removing said first substrate from the adhered structure to expose said porous layer on a second substrate side thereof; and the etching step of etching said porous layer while the second substrate side on which said porous layer is exposed is contacted by an etching solution, thereby exposing a surface of the second substrate side.

47. A semiconductor substrate fabrication method comprising: the step of forming an unporous layer on a porous layer formed on a surface of a first substrate; the step of adhering a first substrate side of a prospective structure and a second substrate prepared separately to sandwich said unporous layer between the first substrate side and said second substrate; the removal step of removing said first substrate from the adhered structure to expose said porous layer on a second substrate side thereof; and the etching step of etching said porous layer while the second substrate side on which said porous layer is exposed is

Art Unit: 2827

contacted by an etching solution, thereby exposing a surface of the second substrate side.

48. A semiconductor substrate fabrication method comprising: the step of forming an unporous layer on a porous layer formed on a surface of a first substrate; the step of adhering a first substrate side of a prospective structure and a second substrate prepared separately to sandwich said unporous layer between the first substrate side and said second substrate; the removal step of removing said first substrate from the adhered structure to expose said porous layer on a second substrate side thereof; and the etching step of etching said porous layer while the second substrate side on which said porous layer is exposed is contacted by an etching solution, thereby exposing a surface of the second substrate side.

However, Sakaguchi does not appear to explicitly teach that the second substrate side is completely dipped into an etching solution, ultrasonic waves are supplied at a frequency, the second substrate side supported substantially perpendicular to a plane of vibration of ultrasonic waves, and the second substrate side supported substantially parallel to a plane of vibration of ultrasonic waves, and swinging the second substrate side to cross a plane of vibration of ultrasonic waves.



Art Unit: 2827

Nevertheless, at column 3, lines 41-44; column 4, lines 6-9; column 5, lines 31-68; column 6, line 56 to column 7, line 19 and 62-65; and column 8, lines 11-23, Matsushita teaches a substrate side 14 completely dipped into an etching solution, and ultrasonic waves are supplied at a frequency, a substrate 14 side supported substantially perpendicular to a plane of vibration of ultrasonic waves, and a second substrate 14 side supported substantially parallel to a plane of vibration of ultrasonic waves, and swinging [via "shaking mechanism 24"] the second substrate side to cross a plane of vibration of ultrasonic waves. Moreover, it would have been obvious to combine the invention of Matsushita with the invention of Sakaguchi because it would facilitate etching.

Also, the applied prior art does not appear to explicitly teach wherein the frequency of ultrasonic waves which act on the second substrate side is adjusted during the etching.

In any case, as cited, Matsushita teaches that the frequency of ultrasonic waves is a result-effective variable. Moreover, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose the particular claimed frequency limitations because applicant has not disclosed that the limitations are for a

Art Unit: 2827

particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another frequency. Indeed, it has been held that optimization of range limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See MPEP 2144.05(II):

"Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'" In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). See also In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969), Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989), and In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990). As set forth in MPEP 2144.05(III), "Applicant can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. 'The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other

Art Unit: 2827

variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.' In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP § 716.02 - § 716.02(g) for a discussion of criticality and unexpected results."

Applicant's amendment and remarks filed 6-24-2 have been fully considered, and are addressed in the rejection supra and are further addressed infra.

Applicants assertion that Yamagata does not qualify as prior art to the rejection of claim 44 is respectfully traversed because a reference used in an anticipatory rejection under 35 U.S.C. 102(e) is not disqualified as prior art if evidence is provided to show common ownership by, or an obligation of assignment to, the same person at the time the invention was made. See MPEP 706.02(1)(3).

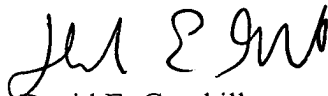
The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

***Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 703-306-3329.***

Art Unit: 2827

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/3087724.



David E. Graybill  
Primary Examiner  
Art Unit 2827

D.G.

17-Sep-02